# PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

# PCT

## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

| | |
|---|---|
| Date of mailing *(day/month/year)* see form PCT/ISA/210 (second sheet) | |
| Applicant's or agent's file reference<br>see form PCT/ISA/220 | **FOR FURTHER ACTION**<br>See paragraph 2 below |
| International application No.<br>PCT/JP2004/018973 | International filing date *(day/month/year)*<br>14.12.2004 |
| Priority date *(day/month/year)*<br>16.12.2003 | |
| International Patent Classification (IPC) or both national classification and IPC<br>G03F7/16, G03F7/00, C11D7/24, G03F7/32 | |
| Applicant<br>SHOWA DENKO K.K. | |

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

| | |
|---|---|
| Name and mailing address of the ISA:<br>European Patent Office - P.B. 5818 Patentlaan 2<br>NL-2280 HV Rijswijk - Pays Bas<br>Tel. +31 70 340 - 2040 Tx: 31 651 epo nl<br>Fax: +31 70 340 - 3016 | Authorized Officer<br>Heywood, C<br>Telephone No. +31 70 340-3666 |

**Box No. I Basis of the opinion**

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

   ☐ a sequence listing

   ☐ table(s) related to the sequence listing

   b. format of material:

   ☐ in written format

   ☐ in computer readable form

   c. time of filing/furnishing:

   ☐ contained in the international application as filed.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 1 (part), 2 (part), 3 (part), 4 (part), 7, 8 (part), 9(part), 11 (part), 12 (part)

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination *(specify)*:

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the whole application or for said claims Nos. 1 (part) , 2 (part), 3 (part), 4 (part), 7, 8 (part), 9 (part), 11 (part), 12 (part)

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

| | | |
|---|---|---|
| the written form | ☐ | has not been furnished |
| | ☐ | does not comply with the standard |
| the computer readable form | ☐ | has not been furnished |
| | ☐ | does not comply with the standard |

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☐ See separate sheet for further details

## Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:

   ☐ paid additional fees.

   ☐ paid additional fees under protest.

   ☒ not paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

   ☐ complied with

   ☒ not complied with for the following reasons:

   **see separate sheet**

4. Consequently, this report has been established in respect of the following parts of the international application:

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1 (part), 2 (part), 3 (part), 4 (part), 5, 6, 8(part), 9 (part), 10, 11 (part), 12 (part)

## Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|---|---|---|---|
| Novelty (N) | Yes: | Claims | 6,10 |
| | No: | Claims | 1 (part), 2 (part), 3 (part), 4 (part), 5, 8 (part), 9 (part), 11 (part), 12 (part) |
| Inventive step (IS) | Yes: | Claims | |
| | No: | Claims | 1 (part), 2 (part), 3 (part), 4 (part), 5, 6, 8 (part), 9 (part), 10, 11 (part), 12 (part) |
| Industrial applicability (IA) | Yes: | Claims | 1(part), 2 (part), 3 (part), 4 (part), 5, 6, 8 (part), 9 (part), 10, 11 (part), 12 (part) |
| | No: | Claims | |

2. Citations and explanations

   **see separate sheet**

**Re Item IV**

**Lack of unity of invention**

(1) According to Rule 13.1 PCT "The International application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept."

(1b) Rule 13.2 PCT states that :
" the requirement of unity of invention referred to in Rule 13.1 PCT shall be fulfilled only when there is a technical relationship among those inventions involving one or more of the same or corresponding special technical features. The expression "special technical features" shall mean those features which define a contribution which each of the claimed inventions considered as a whole makes over the prior art.

(1c) Rule 13.2 PCT further states that :
"The determination whether a group of inventions is so linked as to form a single general inventive concept shall be made without regard to whether the inventions are claimed in separate claims or as alternatives within a single claim."

(2) In the present application the following is claimed :

(2a) Claims 1 (part), 2 (part), 3 (part), 4 (part), 5, 8 (part), 9 (part), 11 (part), 12 (part) describes a photosensitive composition remover comprising
20 to 80 percent by mass of one or more aromatic hydrocarbon(s) having 9 carbon atoms or more within the molecule and; 20 to 80 percent by mass of one or more aprotic polar solvent(s);

(2b) Claims 1 (part), 2 (part), 3 (part), 4 (part), 6, 10, 11 (part), 12 (part) describe a photosensitive composition remover comprising
10 to 20 percent by mass of one or more aromatic hydrocarbon(s) having 9 carbon atoms or more within the molecule and; 80 to 90 percent by mass of one or more other solvent(s) other than aprotic
polar solvents;

(2c) Claims 1 (part), 2 (part), 3 (part), 4 (part), 7, 8 (part), 9 (part), 11 (part), 12 (part) describe a photosensitive composition remover comprising
20 to 30 percent by mass of one or more aromatic hydrocarbon(s) having 9 carbon atoms or more within the molecule, 1 to 20 percent by mass of one or more aprotic polar solvent(s),and; 55 to 70 percent by mass of one or more other solvent(s) other than aprotic polar solvents.

(3) To decide whether a feature common to the three groups of photocurable compositions is a special technical feature, we must apply the teaching of Rules 13.1 and Rule13.2 PCT, which stipulate that the technical feature must define a contribution over the prior art (i.e. be inventive over the prior art) to be recognised as the special technical feature (which gives rise to unity).

(3a) For the purposes of unity, a single general inventive concept is required. This means that the broadest possible problem to be solved has to be drawn up (i.e. to cover all claimed possibilities).

(3b) It is considered that the problem to be solved by the present application is : the provision of further compositions for the removal of uncured photosensitive compositions (see page 3, paragraph 2 of the present description).

(3c) The way the Applicant solves this problem is by providing a photosensitive composition remover comprising either

a) a composition of 20 to 80 percent by mass
of one or more aromatic hydrocarbon(s) having 9 carbon atoms or more within the molecule and,
20 to 80 percent by mass of one or more aprotic polar solvent(s)

b) a composition of 10 to 20 percent by mass
of one or more aromatic hydrocarbon(s) having 9 carbon atoms or more within the molecule and,
80 to 90 percent by mass of one or more other solvent(s) other than aprotic polar solvents

c) a composition of 20 to 30 percent by mass
of one or more aromatic hydrocarbon(s) having 9 carbon atoms or more within the molecule,
1 to 20 percent by mass of one or more aprotic polar solvent(s), and
55 to 70 percent by mass of one or more other solvent(s) other than aprotic polar solvents

(3d) However the problem and one of its solutions is known and thus the following document is cited here :

D1 = US 2003118946 A

(3e) The document US 2003118946 A (D1) discloses a photosensitive composition remover (example 24 on page 10; and table 6 on pages 10 and 11) comprising:

(I) 20 wt % (diisopropylbenzene);
(ii) 80 wt % of two solvents which are not dipolar aprotic solvents (20 wt % benzyl alcohol and 60 wt % isoparaffinic hydrocarbon (EXXON Isopar™) ;

The composition is used to remove uncured photosensitive compositions; being a developer (see claims 1-3).

(3e) Thus the photocurable composition remover of D1 solves the problem in an identical manner to the present application. In the light of the document D1, the solution proposed in the present application, to the problem mentioned above, is known from the prior art, and the use of such compositions in processes cannot be regarded as the special technical feature which links together the separate inventions disclosed in the present application.

(3f) Since there are no apparent features which may be regarded as the special technical feature, which could link the different inventions of the application, then there is a lack of unity.

(3g) In the light of the above, the examiner has identified three different subjects.

Subject 1.

Claims 1 (part), 2 (part), 3 (part), 4 (part), 5, 8 (part), 9 (part), 11 (part), 12 (part)

a photosensitive composition remover comprising:
20 to 80 percent by mass
of one or more aromatic hydrocarbon(s) having 9 carbon atoms or more within the molecule and,
20 to 80 percent by mass of one or more aprotic polar solvent(s)

Subject 2.
Claims 1 (part), 2 (part), 3 (part), 4 (part), 6, 10, 11 (part), 12 (part)

a photosensitive composition remover comprising:
10 to 20 percent by mass
of one or more aromatic hydrocarbon(s) having 9 carbon atoms or more within the molecule and,
80 to 90 percent by mass of one or more other solvent(s) other than aprotic polar solvents;

Subject 3.
Claims 1 (part), 2 (part), 3 (part), 4 (part), 7, 8 (part), 9 (part), 11 (part), 12 (part)

a photosensitive composition remover comprising:
20 to 30 percent by mass
of one or more aromatic hydrocarbon(s) having 9 carbon atoms or more within the molecule,
1 to 20 percent by mass of one or more aprotic polar solvent(s), and
55 to 70 percent by mass of one or more other solvent(s) other than aprotic polar solvents.

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Although **Subject I** and **Subject II** are two seperate inventions, both inventions were

grouped together because they were covered by the search for the first subject.

Reference is made to the following documents:
D1: US 2003118946 A
D2: US 5 350 663 A
D3: EP 1 097 923 A
D4: US 4 120 810 A

**Subject I**

**Novelty**

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1 (part), 2 (part), 3 (part), 4 (part), 5, 8 (part), 9 (part), 11 (part), 12 (part) is not new in the sense of Article 33(2) PCT.

The present wording of claim 1, must be construed as a photosensitive composition remover suitable for removal of an uncured photosensitive compostion.
In other words if a known composition is in a form suitable for the stated use, though it has never been described for that use, it would deprive the claim of novelty (PCT Guidelines 5.21).

1) Claims 1 (part), 2 (part), 3 (part), 4 (part), 5, 8 (part), 9 (part), 11 (part), 12 (part)

The document US 5 350 663 A (D2) discloses a solvent composition comprising (example 3 and column 8, lines 55-63):

one or more aromatic hydrocarbon having 9 carbon atoms or more being an alkyl benzene; namely Solvesso S-100™ 22 wt. % (column 9, line 6; as used in some of the examples of the present application, see "s-100" in table 1 on page 24 of the present application), and
a polar aprotic solvent; namely N-methylpyrrolidone; 78 wt.% (column 9, line 8).

2) Claims 1 (part), 2 (part), 3 (part), 4 (part), 5, 8 (part), 9 (part), 11 (part), 12 (part)
The document EP 1 097 923 A (D3) discloses a solvent composition comprising (paragraph 73 on page 25):

one or more aromatic hydrocarbons having 9 carbon atoms or more, being an alkyl benzene; namely Solvesso 200™; 50 wt %, and
a polar aprotic solvent; namely N,N-dimethylacetamide; 50 wt %.

3) Claims 1 (part), 2 (part), 3 (part), 4 (part), 5, 8 (part), 9 (part), 11 (part), 12 (part)

The document US 4 120 810 A (D4) discloses a solvent composition comprising (example 1 in columns 5 and 6):

one or more aromatic hydrocarbons having 9 carbon atoms or more; namely Panasol AN-1™ 25 wt % (column 5, lines 52-54; and column 6, lines 7-9); and
a polar aprotic solvent ; namely NMP i.e. N-methylpyrrolidone 75 wt % (column 6, lines 7-9).

**Subject II**

**Novelty**
The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1 (part), 2 (part), 3 (part), 11 (part), 12 (part) is not new in the sense of Article 33(2) PCT. 4)

1) Claims 1 (part), 2 (part), 3 (part), 11 (part), 12 (part)

The document US 2003118946 A (D1) discloses a developer composition comprising (example 24 on page 10);

one or more aromatic hydrocarbons having 9 carbon atoms or more; namely diisopropylbenzene 20 wt %; and solvents other than aprotic polar solvents; namely benzyl alcohol 20 wt % and isoparaffinic hydrocarbon (EXXON Isopar™ L) 60 wt %.

**Inventive Step**

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 6, 10 does not involve an inventive step in the sense of Article 33(3) PCT.

Dependent claims 6, 10 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT with respect to inventive step, the reasons being as follows:
The dependent claims 6, 10 refer to modifications and features which appear to be merely a random selection.